

A NEW GENUS AND SPECIES OF PSEPHENINAE
(COLEOPTERA: DRYOPOIDEA: PSEPHENIDAE) FROM MEXICO

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Abstract.—*Psephenotarsis triangularis*, n. gen. and n. sp., is described and illustrated from Veracruz State, Mexico. *Psephenotarsis triangularis* can be separated from other Psepheninae by the shape of the body and length of the antenna (*Pheneps*), the size proportion between the phallobase and the parameres (*Pheneps*), the pronotum and tarsi (*Psephenops*), and the tarsi and the median lobe of male genitalia (*Psephenus*). *Psephenotarsis* appears to be more closely related to *Psephenops* than other Psepheninae. A key for the New World genera of Psepheninae is provided.

Resumen.—Se describe e ilustra a *Psephenotarsis triangularis*, n. gen. y n. sp., con base en especímenes del estado de Veracruz, México. *Psephenotarsis triangularis* se puede diferenciar de otros Psepheninae por la forma del cuerpo y la longitud de la antena (*Pheneps*), la proporción entre la falobase y los parámetros (*Pheneps*), el pronoto y los tarsos (*Psephenops*), y los tarsos y el lóbulo medio de los genitales masculinos (*Psephenus*). Al parecer *Psephenotarsis* está más cercanamente relacionado a *Psephenops* que al resto de los Psepheninae. Se proporciona una clave para la identificación de los géneros de Psepheninae.

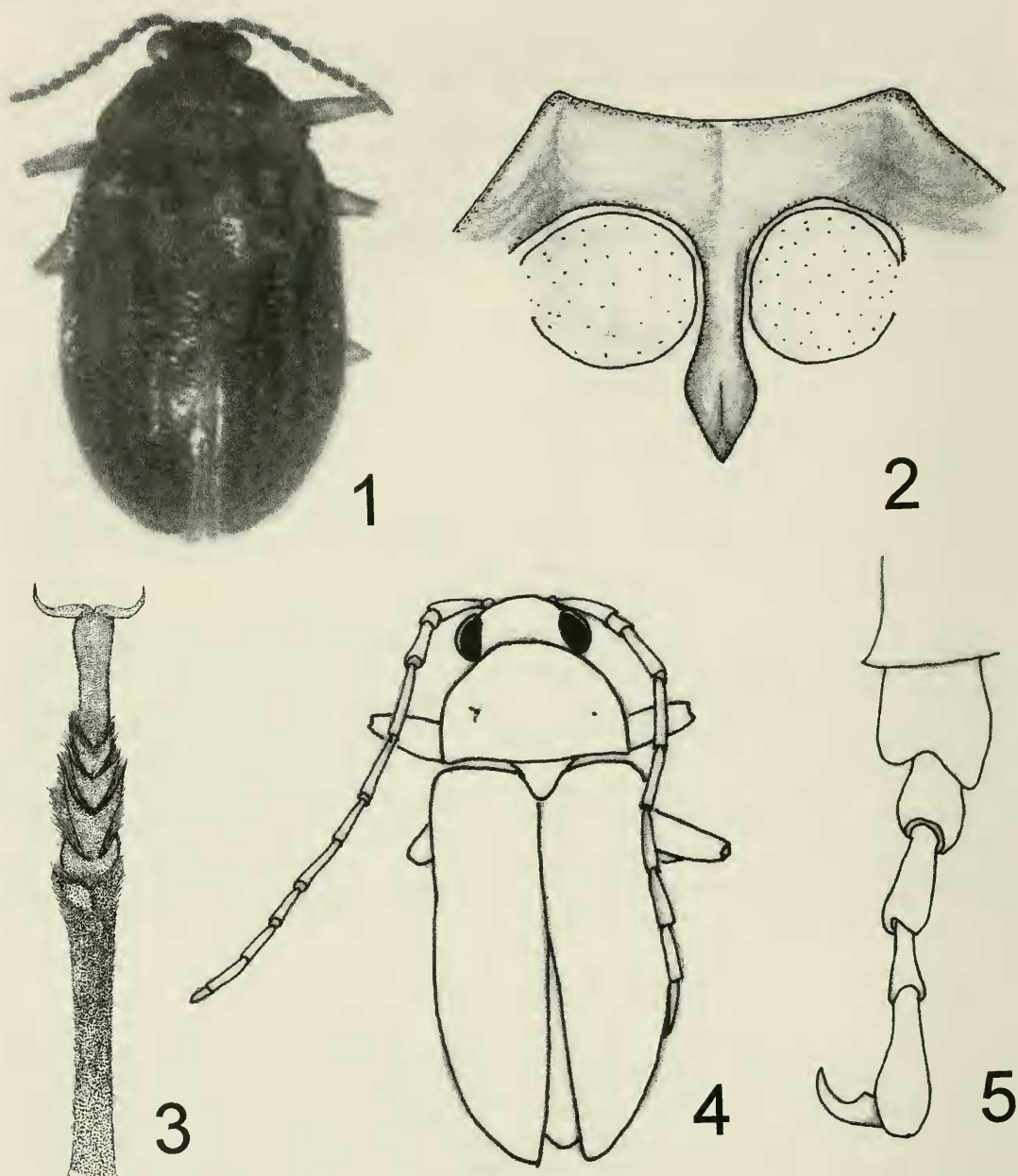
Key Words: Psephenidae, Psepheninae, new genus, description, key, Veracruz State, Mexico

The subfamily Psepheninae is represented in the New World by the genera *Psephenus* Haldeman 1853, *Psephenops* Grouvelle 1898 and *Pheneps* Darlington 1936 (Brown 1981, Spangler 1982). *Psephenus* contains 15 species (seven in North America, two of them shared with Mexico; four species in Mesoamerica; three species in Brazil and one species in Peru); *Psephenops* has seven species (Arce-Pérez and Novelo-Gutiérrez 2000) with tropical distribution (Mexico, Guatemala, Costa Rica, Colombia, Argentina, Haiti, and the Antilles); *Pheneps* has four species also with tropical distribution (Venezuela, Surinam,

Haiti, and Cuba). In this paper, we describe a new genus and a new species based on two males and one female recently collected in a mountain cloud forest at 1800 m altitude, in the Municipality of Xico, Veracruz State, Mexico.

***Psephenotarsis* Arce-Pérez, new genus**
(Figs. 1–3)

Description.—Head short, transverse, concave dorsally between compound eyes, quite visible from above (Fig. 1); eyes spherical, very prominent, reddish yellow; antenna short (e.g., hardly reaching the apex of scutellum), moniliform, 11-seg-



Figs. 1-5. 1-3, *Psephenotarsis triangularis*. 1, Habitus, dorsal view. 2, Prosternum, ventral view. 3, Protarsal segments. 4, Habitus of *Pheneps cursitatus*, dorsal view. 5, Protarsal segments of *Pheneps antennalis*. (Fig. 4 from Spangler 1987; Fig. 5 from Spangler and Steiner 1983).

mented, scape robust, larger than remainder of antennomeres, scape and pedicel yellowish brown, flagellomeres dark brown to black.

Pronotum trapezoidal, its posterior margin quite smooth, never crenulate nor ru-

gose, lateral margins expanded, without dorsal carinae; prosternum short, neither raised nor carinate at its mediobasal portion, prosternal process long, parallel-sided at middle then gradually diverging to form a lanceolate apex, with a weak longitudinal

carina on its apex (Fig. 2); mesosternum clearly grooved and widely bifurcate apically, making both procoxa and mesocoxa appear more separate from each other than in other Psepheninae. Basal four tarsomeres notably triangular (Fig. 3), flattened and widely emarginate at apex, beset with long black setae, tarsomeres 1 and 2 with dense ventral vestiture of long setae, setae on first tarsomere reaching basal half of second one, setae on second tarsomere extending to base of fifth one, covering tarsomeres 3 and 4 ventrally; fifth tarsomere longest, as long as preceding ones together, stout, subcylindrical; tarsal claws entire, never bifid or split, widely separate, downcurved in apical half, widened at base and without teeth or accessory membranes.

Male genitalia subrectangular, trilobate; phallobase shorter than parameres; parameres shorter than median lobe, internal margin of apical half sinuate, ending in a more or less sharply-pointed tip, the lateroapical portion membranous; median lobe long, wide, in lateral view moderately convex ventrally, sclerotized.

Remarks.—*Psephenotarsis* can be separated from other genera of Psepheninae by the following: body more slender in *Phe-neps*, antenna longer, reaching 0.75 the length of elytra, pronotum and elytra without expanded margins (Fig. 4), tarsomeres 1–2 clearly stouter than any of apical three tarsomeres (Fig. 5), phallobase notably larger than parameres (Fig. 9).

The basal half of pronotum in *Psephen-ops* has a longitudinal crest (Fig. 6); tarsomeres 1 and 2, and occasionally 3, bearing long, wide, ventral pads which totally cover the apical tarsomeres (Fig. 7); median lobe of male genitalia mostly membranous (Fig. 10).

The basal four tarsomeres in *Psephenus* are slender and subcylindrical, slightly emarginate at apex, with delicate, minute setae or papillae ventrally (Fig. 8). The median lobe of male genitalia mostly membranous and shorter or as long as parameres (Fig. 11).

Psephenotarsis appears to be more closely related to *Psephenops* than other Psepheninae, mainly by the short antennae, lateral margins of pronotum and elytra ridged, posterior margins of sternites 1 and 2 slightly sinuate or emarginate, the basal two tarsomeres with long vestiture of setae, and in general appearance.

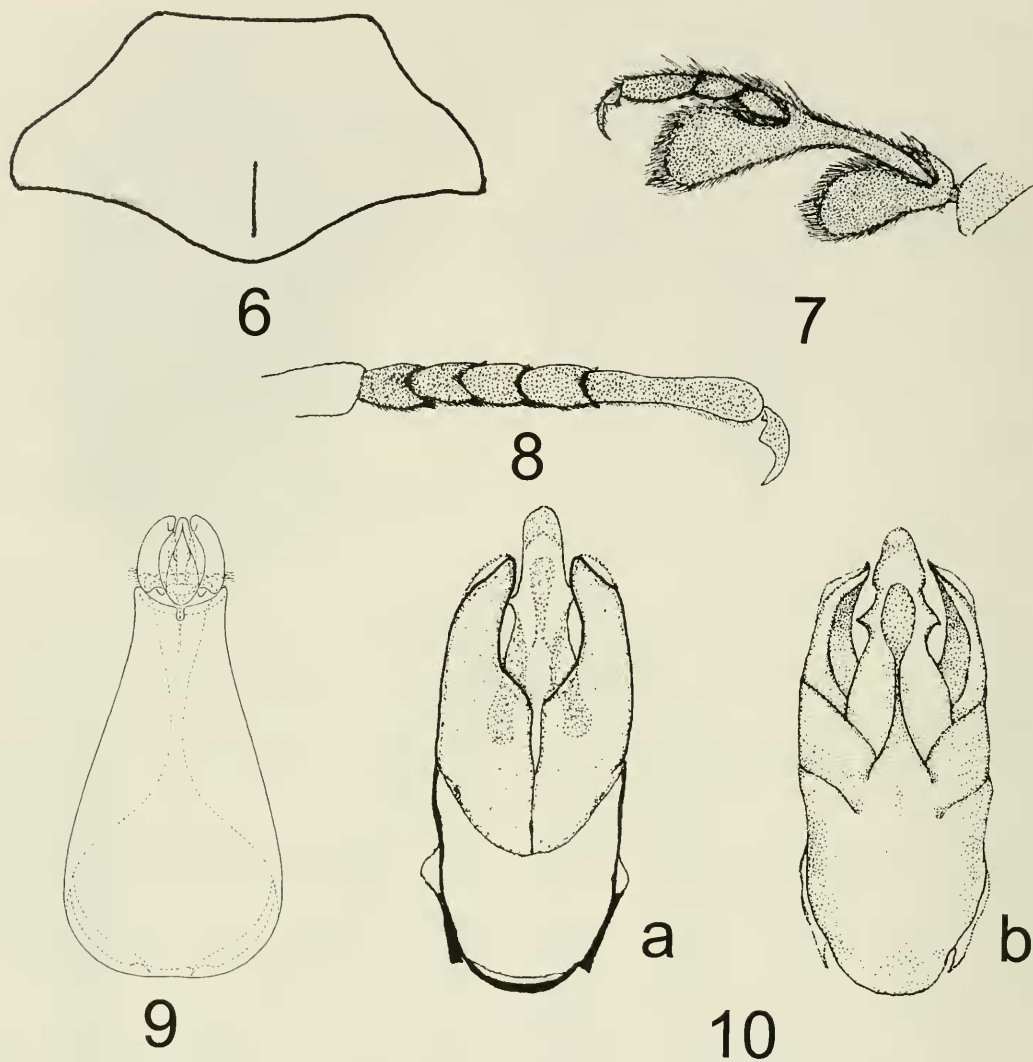
Etymology.—From the Greek *Psepheno* = hidden, and *tarsis* = tarsomeres, making reference to this hitherto unknown genus with a characteristic tarsal shape which distinguishes this genus from other Psephenines.

Psephenotarsis triangularis Arce-Pérez,
new species

(Figs. 1–3, 12–13)

Description.—Holotype male: Body oval and depressed, total length 4.20 mm, maximum humeral width 2.05 mm. Head, pronotum and scutellum black, covered with intermingled short and long dark-reddish setae; elytra dark reddish-brown, densely covered with short, brilliant yellow setae arranged in four longitudinal bands, and long, dark reddish setae on entire surface. Venter reddish-brown, with short and long reddish-yellow setae. Coxae, tibiae and tarsi reddish-brown, trochanters and femora yellowish.

Head: short, transverse (Fig. 1), concave dorsally between compound eyes; eyes spherical, very prominent; clypeus subrectangular, wider than long, slanting, forming an angle less than 90 degrees in relation to frons, its apex widely emarginate; labrum as clypeus but shorter; antenna short, hardly reaching apex of scutellum, moniliform, 11-segmented, covered with long reddish-black setae, scape larger than remainder of antennomeres, slightly curved and yellowish, pedicel half as long as scape; maxillary palp 4-segmented (Fig. 12), slightly longer than first two antennomeres combined, basal three palpomeres subcylindric, first one shortest, second one 3 times longer than first one and wider, third palpomere half as long as second one but wider, fourth one

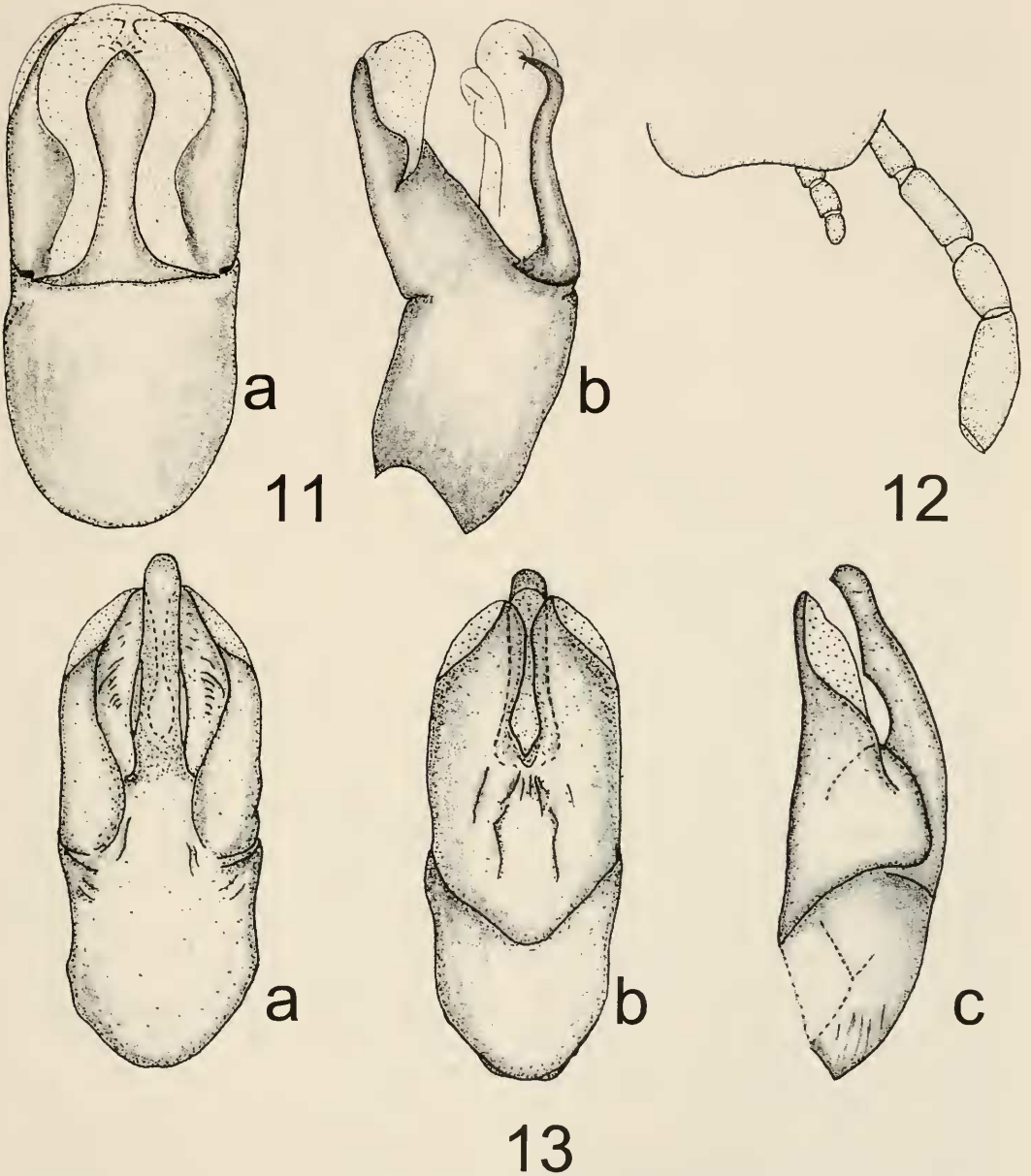


Figs. 6–10. 6–7 and 10, *Psephenops mexicanus*. 6, Pronotum, dorsal view. 7, Protarsal segments. 8, Protarsal segments of *Psephenus* sp. 9, Male genitalia of *Pheneps antennalis*, dorsal view. 10, Male genitalia of *P. mexicanus*, (a) ventral view, (b) dorsal view. (Figs. 6–7 and 10 from Arce-Pérez and Novelo-Gutiérrez 2000; Fig. 9 from Spangler and Steiner 1983).

slightly longer than 2nd one but stouter and acuminate, laterally compressed and truncate at apex, all palpomeres reddish brown and covered with black setae; labial palp small (Fig. 12), 3-segmented, not extending beyond basal margin of second maxillary palpomere, basal two labial palpomeres cylindrical, larger than third one which is sub-spherical, all of them reddish brown with black setae.

Thorax: Pronotum trapezoidal (basal

width 1.75 mm, apical width 1 mm), wider than long (width 1.75 mm, length 0.85 mm), its anterior margin arcuate, posterior margin bisinuate and slightly narrower than elytral bases, lateral margins straight and convergent at their anterior half, then suddenly expanded at posterior half, postero-lateral angles obtuse. Scutellum short, triangular, its apex rounded. Elytra 3.2 mm length (from base to apex of elytral suture), 2.01 mm width (measured across *calla hu-*



Figs. 11–13. 11. Male genitalia of *Psephenus palpalis*, (a) ventral view, (b) lateral view. 12–13. *Psephenotarsis triangularis*. 12. Maxillary and labial palpi. 13. Male genitalia, (a) ventral view, (b) dorsal view, (c) lateral view.

meralis), gradually widening caudad, reaching its maximum width at middle then narrowing to apex entirely covering abdomen, beset with four longitudinal bands of yellow, dense, short setae intermingled with four longitudinal bands of reddish brown, sparse, long setae, these two types of bands

extending along entire length of elytra. Prosternum large, as described for genus; procoxa globose; femur ovate and thick, its internal margin and apex dark; tibia slender and straight, slightly shorter than femur, with small ventral tooth on apex; tarsi as described for genus but first tarsomere

widely concave at its apical margin, second to fourth tarsomeres with their apical margins V-shaped, sharply-pointed lateral extensions on second tarsomere totally covering third one (Fig. 3). Mesosternum short, mesosternal groove deep for reception of prosternal process, clearly bifurcate caudad; mesocoxa prominent, slightly transverse, other features of midleg as described above except tibia without apical tooth. Metasternum large, slightly convex, with longitudinal, shallow, wide groove at middle which ends in a semi-triangular cavity; metacoxa transverse and wide, trochanter long and triangular, other features as described above.

Abdomen: Convex ventrally but slightly flattened on midline, with seven sterna, second sternum largest, sixth sternum shortest and slightly emarginate at middle, posterior margin of sterna 1 and 2 slightly sinuate at middle; abdominal segment 7 strongly reduced to an oval sclerite; pygidium oval, convex, with long yellowish black setae.

Genitalia: Short, wide, subrectangular, trilobate; paramere shorter than median lobe (Figs. 13a, b), robust, in dorsal view (Fig. 13b) its basal half subrectangular with internal margin in close contact with that of other paramere, its apical half abruptly and strongly narrowed at 0.75 of paramere's length ending in a sharp point, its internal margin sigmoid and widely separate from that of other paramere by a drop-shaped space; a translucent membrane at lateroapical part (Fig. 13). Median lobe long, subcylindrical, sclerotized (Figs. 13a, c), in lateral view (Fig. 13c) moderately convex ventrally. Total length (from basal margin of phallobase to apex of median lobe) 0.56 mm; length of phallobase 0.26 mm, parameres 0.30 mm, median lobe 0.33 mm.

Allotype female: Slightly larger and stouter than male, total length 4.2 mm, maximum width (at level of humeri) 2.2 mm. In other features similar to male except: abdomen wider than that of male, with six sterna, first two sterna with their posterior margins slightly sinuate.

Type material.—Holotype ♂ labeled:

“MEXICO, VERACRUZ, XICO, Xico Viejo, 1,800 m, bosque mesófilo de montaña 16-VIII-98, Roberto Arce col.” Allotype ♀: same data as holotype, except: 3-VIII-97. Paratype ♂: same data as holotype. All material deposited at Colección Entomológica del Instituto de Ecología, A.C., Xalapa, Veracruz, México.

Etyymology.—The name *triangularis* refers to the triangular shape of the basal four tarsomeres of the legs.

Type locality.—Xico Viejo, Municipality of Xico, Veracruz State, México.

Habitat.—Specimens of *Psephenotarsis triangularis* were captured in a stream with rapid water flow, on overhanging riparian vegetation and on big rocks not exposed directly to the water current but in the spray zone.

KEY TO THE GENERA OF PSEPHENINAE OF THE NEW WORLD

[Modified from Brown (1976) and White & Brigham (1996)]

1. Antenna long, filiform, extending notably beyond the elytral humeri (Fig. 4); pro- and mesotarsomeres 1 and 2 markedly stouter than the following three and slightly emarginate at apex (Fig. 5); phallobase much longer and wider than parameres (Fig. 9) *Pheneps* 2
- Antenna short, moniliform or subserrate, scarcely or not extending the elytral humeri; pro- and mesotarsomeres 1 and 2 of variable length but never stouter than following three (Figs. 3, 7–8); phallobase subequal in length to parameres 2
2. Tarsomeres 1 and 2, and, occasionally tarsomere 3, with long, spongy-like laminar expansions almost completely covering the remaining tarsomeres (Fig. 7); pronotum with a well developed, medio-basal, longitudinal carina (Fig. 6) *Psephenops* 3
- Tarsomeres 1 and 2 without such laminar expansions; pronotum without longitudinal carina 3
3. Tarsomeres 1–4 short, triangular, flattened, deeply emarginate for the reception of the following tarsomere; tarsomeres 1–2 with long ventral setae or papillae, those on 2 reaching the base of the fifth tarsomere (Fig. 3) *Psephenotarsis*, n. gen. 3
- Tarsomeres 1–4 subconic and slender, scarcely emarginate at apex; tarsomeres 1–2 usually

with ventral setae or papillae that never cover the contiguous tarsomere (Fig. 8) *Psephenus*

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LITERATURE CITED

- Arce-Pérez, R. and R. Novelo-Gutiérrez. 2000. First record of the genus *Psephenops* (Coleoptera: Psephenidae) from Mexico, with a description of a new species. *Entomological News* 111(3): 196–200.
- Brown, H. P. 1976. Aquatic dryopoid beetles (Coleoptera) of the United States. United States Environmental Protection Agency. Water Pollution Control Research Series 18050/72 (Second Printing). Aquatic Biology Section. Cincinnati, Ohio, 82 pp.
- . 1981. A distributional survey of the world genera of riffle beetles (Coleoptera: Dryopidae, Elmidae and Psephenidae). *The Pan-Pacific Entomologist* 57(1): 133–148.
- Spangler, P. J. 1987. A new species of water penny beetle, *Pheneps cursitatus*, from Cerro de la Neblina, Venezuela (Coleoptera: Dryopoidea: Psephenidae). *Proceedings of the Entomological Society of Washington* 89(2): 219–225.
- . 1982. Coleoptera, pp. 323–395. *In* Hurlbert, S. H. and A. Villalobos-Figueroa, eds. *Aquatic Biota of Mexico, Central America and West Indies*. San Diego, University of San Diego, California.
- Spangler, P. J. and W. E. Steiner. 1983. New species of beetles of the genera *Elmoparnus* and *Pheneps* from Suriname (Coleoptera: Dryopidae: Psephenidae). *Proceedings of the Entomological Society of Washington* 85(4): 826–839.
- White, D. S. and W. V. Brigham. 1996. Aquatic Coleoptera, pp. 399–473. *In* Merritt, R. W. and K. W. Cummins, eds. *An Introduction to the Aquatic Insects of North America*. Third Edition, Kendall/Hunt Publishing Company, Dubuque, Iowa.